## ABSTRACT

[00130] An illumination source is optimized by changing the intensity and shape of the illumination source to form an image in the image plane that maximizes the minimum ILS at user selected fragmentation points while forcing the intensity at the fragmentation points to be within a small intensity range. An optimum mask may be determined by changing the magnitude and phase of the diffraction orders to form an image in the image plane that maximizes the minimum ILS at user selected fragmentation points while forcing the intensity at the fragmentation points to be within a small intensity range. An optimal mask may be used to create a CPL mask by assigning areas of minimum transmission in an optimum transmission mask a -1, and areas of maximum transmission a +1. Primitive rectangles having a size set to a minimum feature size of a mask maker are assigned to the located minimum and maximum transmission areas and centered at a desired location. The edges of the primitive rectangle are varied to match optimal diffraction orders O(m,n). The optimal CPL mask $O_{CPL}(x,y)$ is then formed.